



RAMAIAH
Institute of Technology

CURRICULUM

for the Academic year 2019 – 2020

SCHOOL OF ARCHITECTURE

III & IV Semester B. ARCH.

RAMAIAH INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)

Bangalore – 560054.

About the Institute:

Ramaiah Institute of Technology (RIT) (formerly known as M. S. Ramaiah Institute of Technology) is a self-financing institution established in Bangalore in the year 1962 by the industrialist and philanthropist, Late Dr. M S Ramaiah. The institute is accredited with “A” grade by NAAC in 2014 and all engineering departments offering bachelor degree programs have been accredited by NBA. RIT is one of the few institutes with prescribed faculty student ratio and achieves excellent academic results. The institute was a participant of the Technical Education Quality Improvement Program (TEQIP), an initiative of the Government of India. All the departments have competent faculty, with 100% of them being postgraduates or doctorates. Some of the distinguished features of RIT are: State of the art laboratories, individual computing facility to all faculty members. All research departments are active with sponsored projects and more than 304 scholars are pursuing PhD. The Centre for Advanced Training and Continuing Education (CATCE), and Entrepreneurship Development Cell (EDC) have been set up on campus. RIT has a strong Placement and Training department with a committed team, a good Mentoring/Proctorial system, a fully equipped Sports department, large air-conditioned library with over 1,35,427 books with subscription to more than 300 International and National Journals. The Digital Library subscribes to several online e-journals like IEEE, JET etc. RIT is a member of DELNET, and AICTE INDEST Consortium. RIT has a modern auditorium, several hi-tech conference halls and all are air-conditioned with video conferencing facilities. It has excellent hostel facilities for boys and girls. RIT Alumni have distinguished themselves by occupying high positions in India and abroad and are in touch with the institute through an active Alumni Association. RIT obtained Academic Autonomy for all its UG and PG programs in the year 2007. As per the National Institutional Ranking Framework, MHRD, Government of India, Ramaiah Institute of Technology has achieved 64th rank in 2019 among the top 100 engineering colleges across India.

SCHOOL OF ARCHITECTURE

Ramaiah Institute of Technology (RIT), Bangalore, is a leading institution offering undergraduate, post graduate and research programs in the areas of Engineering, Management and Architecture. The institute was established in the year 1962 under the aegis of Gokula Education Foundation. Its mission is to deliver Global quality technical education by nurturing a conducive learning environment for better tomorrow through continuous improvement and customization.

The School of architecture, RIT, Bangalore, was established in the year 1992. Since its establishment, the school has played a vital role in providing quality education. The Council of Architecture (COA) and AICTE has recognized this program.

The Mission of the School is to uphold RIT mission, thus provide quality education to the students and mould them to be excellent Architects with adequate management skills and noble human qualities.

Full time faculty members having postgraduate qualification from prestigious institutions in India and abroad are teaching in this school. Experienced and well respected practicing architects are invited to provide their experiences as visiting faculty. New milestones are continually being set and achieved. The synergy of the progressive management, committed faculty and students ensure in excellent academic results year after year. This is reflected in the high number of University ranks that are secured.

The School of Architecture is now autonomous (affiliated to VTU) providing scope for further improvement. The focus has been towards fostering novel concepts and solutions in Architectural design. The student's response is very encouraging and the school recognizes and appreciates such good students by awarding them. Many of the students after graduation have pursued higher studies in various universities in India and abroad. There is a good demand for the school graduates in the industry and is developing initiatives towards co-branding of the industry and the institution school. Many have started their own enterprise and architectural practice as well.

All this has been possible as a result of the efforts of the impeccable faculty of the school. The faculty is committed to the welfare and success of the students. The teachers of the school are also engaged in enhancing their knowledge and skills and many are engaged in research activities as well. The school has experts in specialized disciplines like Habitat Design, Product Design, Urban Design, Urban Planning, Landscape Architecture, Heritage Conservation and Interior Design. Faculties of the school also actively participate in National and International conferences and publish and present papers.

The school as part of consultancy started off with the maiden project to redevelop the RIT engineering college campus and is now involved in various campus designs.

VISION OF THE INSTITUTE

To be an Institution of International Eminence, renowned for imparting quality technical education, cutting edge research and innovation to meet global socio economic needs

MISSION OF THE INSTITUTE

MSRIT shall meet the global socio-economic needs through

- Imparting quality technical education by nurturing a conducive learning environment through continuous improvement and customization
- Establishing research clusters in emerging areas in collaboration with globally reputed organizations
- Establishing innovative skills development, techno-entrepreneurial activities and consultancy for socio-economic needs

QUALITY POLICY

We at MS Ramaiah Institute of Technology strive to deliver comprehensive, continually enhanced, global quality technical and management education through an established Quality Management System complemented by the synergistic interaction of the stake holders concerned

VISION OF THE DEPARTMENT

To achieve and propagate high standards of excellence in architectural education.

MISSION OF THE DEPARTMENT

- The school's commitment is to prepare people to make a difference;
- To create an environment that shall foster the growth of intellectually capable, innovative and entrepreneurial professionals, who shall contribute to the growth of the society by adopting core values of learning exploration, rationality and enterprise; and
- To contribute effectively by developing a sustainable technical education system to meet the changing technological needs incorporating relevant social concerns and to build an environment to create and propagate innovative designs and technologies.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

- PEO 1:** Use the knowledge and skills of Architecture to analyze the real life problems and interpret the results.
- PEO 2:** Effectively design, implement, improve and manage the integrated socio-technical systems.
- PEO 3:** Build and lead cross-functional teams, upholding the professional responsibilities and ethical values.
- PEO4:** Engage in continuing education and life-long learning to be competitive and enterprising.

PROGRAM SPECIFIC OUTCOMES (PSOs):-

- a. Apply knowledge and skills of arts and sciences to the various architectural scenarios.
- b. Design and develop projects based on function, form and analysis.
- c. Design and improve integrated systems of people, materials, information, facilities, and technology.
- d. Function as a member of a multi-disciplinary team.
- e. Identify, formulate and solve industrial requirements and problems.
- f. Understand and respect professional and ethical responsibility.
- g. Communicate effectively both orally and in writing.
- h. Understand the impact of design solutions in a global and societal context.
- i. Recognize the need for and an ability to engage in life-long learning.
- j. Have knowledge of contemporary issues in industrial and service sectors.
- k. Use updated techniques, skills and tools of architecture throughout their professional careers.
- l. Implement the concepts of project and construction management to satisfy customer expectations.

Curriculum breakdown structure:

The curriculum of Architecture program is so structured to include all the courses that together satisfy the requirements of the program specific criteria prescribed by the **Council of Architecture**. The Course code, Course title, the number of contact hours and the number of credits for each course are given in the following table. The courses are grouped in line with the major components of the curriculum namely: (i) Humanities and Social Sciences, (ii) Arts and Science, (iii) Basic Architecture and Engineering courses, (iv) Professional core courses, (v) Electives and (vi) Project and industry exposure/internship.

Breakup of Credits for B Arch Degree Curriculum. (I to X Semester)

Sem	HSS	AS	BAE	PCS	Electives	Project / Internship	Total Credits
I	1	7	7	11	-	-	26
II	-	8	7	11	-	-	26
III	-	6	8	11	-	1	26
IV	1	3	11	11	-	-	26
V	2	6	6	11	-	1	26
VI	2	-	13	11	-	-	26
VII	3	-	9	11	3	-	26
VIII	2	-	6	15	3	-	26
IX	-	-	-	-	-	26	26
X	-	-	-	5	3	18	26
Total	11	30	67	97	9	46	260

HSS	- Humanities and Social Sciences	- 11
AS	- Arts and Science	- 30
BAE	- Basic Architecture & Engineering	- 67
PCS	- Professional Core Subjects	- 97
Elective	- Professional Electives, relevant to the chosen specialization	- 09
Project / Internship	- Project Work and Internship in Architect's office	- 46

Board of Studies for the Term 2019-2020

- | | | |
|-----|-------------------------------|--------------------------|
| 1. | Prof. (Dr.) Pushpa Devanathan | Chairperson |
| 2. | Ar. Chitra Vishwanath | VTU Nominee |
| 3. | Ar. Vidyadhar S. Wodeyar | External Industry Expert |
| 4. | Ar. Ulhas Rane | External Industry Expert |
| 5. | Dr. Rama RS | Academician |
| 6. | Dr. Chidambara Swamy | Academician |
| 7. | Ar. Subbiah T S | Alumni |
| 8. | Prof. Vishwas Hittalmani | Member |
| 9. | Prof. (Dr.) Rajshekhar Rao | Member |
| 10. | Prof. (Dr.) Jotirmay Chari | Member |
| 11. | Dr. Rashmi Niranjana | Member |
| 12. | Dr. Monalisa Vyas | Member |
| 13. | Er. Vijayanand M | Member |

SCHOOL OF ARCHITECTURE

TEACHING STAFF

Sl No	Name	Qualification	Designation
1	Ar. Pushpa Devanathan	M.Arch., P.G.D.I.(PhD)	Professor & Head of Department
2	Ar. Vishwas Hittalmani	M Des	Professor
3	Ar. Rajshekhar Rao	M L Arch (PhD)	Professor & Head-M.Arch(Landscape Architecture)
4	Ar. Jotirmay Chari	M Arch (PhD)	Professor
5	Prof. Prasad G	M.Arch	Professor (Tenure Faculty)
6	Dr. Rashmi Niranjana	PhD , MFA (Fine arts)	Associate Professor
7	Dr. Monalisa	M Arch , PhD	Associate Professor
8	Ar. Surekha R	M.L Arch	Associate Professor
9	Ar. Lavanya Vikram	M.L Arch	Associate Professor
10	Ar. Sudha Kumari	M.Arch	Associate Professor
11	Ar. Meghana K Raj	M L Arch	Associate Professor
12	Ar. Tejaswini H	M. L.Arch	Associate Professor
13	Ar.Sudhir Chougule	M L Arch	Associate Professor (Tenure Faculty)
14	Ar. Mallika P V	P G – Urban Design	Associate Professor (Tenure Faculty)
15	Ar. Nikhil V Wodeyar	M L.Arch	Associate Professor(Tenure Faculty)
16	Er. Vijayanand M	M Tech (PhD)	Assistant Professor
17	Er. Aruna Gopal	BE	System Analyst
18	Ar. Shivdeepthi Reddy	M.Arch(Architectural Conservation)	Assistant Professor
19	Ar. Kriti Bhalla	B.Arch	Assistant Professor
20	Ar. Kanika Bansal	M.Arch(Environmental Planning)	Assistant Professor

21	Ar. Apoorva Lakshmi R	B.Arch	Assistant Professor
22	Ar. Aishwarya Yoganand	M.Sc(Sustainable Building Systems)	Assistant Professor
23	Ar. Divya Susanna Ebin	M Arch (Urban Design)	Assistant Professor
24	Ar. Yashas Hegde	M Arch (Urban Design)	Assistant Professor
25	Ar. Arpita Sarkar	M L.Arch	Assistant Professor
26	Ar. Jyotsna Rao J	M LArch	Assistant Professor
27	Ar. Ranjitha Govindaraj	M L.Arch	Assistant Professor
28	Ar. Reema Harish Gupta	M.Arch (Urban Design)	Assistant Professor
29	Ar. Trisha Sinha	M.Tech (Infrastructure systems)	Assistant Professor
30	Ar. Theju V Gowda	M Sc. Architecture	Assistant Professor
31	Ar. Akshata Shagoti	M.Arch	Assistant Professor
32	Ar. Amala Anna Jacob	M.Arch (Urban Design)	Assistant Professor
33	Ar. Meghana M	M.Arch (World Heritage Studies)	Assistant Professor
34	Ar. Sheethal B S	M.Arch (Regional Planning)	Assistant Professor

ADMINISTRATIVE STAFF

1	Mrs. Padmavathy. B	MBA	FDA
2	Mrs. Ambika	M Tech	Assistant Instructor
3	Mr. Nagesh B.L	Dip. in Mech.Engg.	Assistant Instructor

SUPPORT STAFF

1	Mr. Ramachandra Chari	Attender
2	Mr. Penchaliah	Attender

**SCHEME OF TEACHING AND EXAMINATION III SEMESTER B ARCH
ACADEMIC YEAR 2019- 2020**

2018 Batch			Teaching scheme per week			Examination scheme		CIE Marks	SEE Marks
Sl. no	Code	Subject	Lecture	Tutorial	Practical (Study Tour/ Case study)	Total	Exam		
1	AR 301	Architectural Design II	6	0	1	7	SEE (Viva voce)	50	50
2	AR 302	Building Materials & Construction Technology III	3	0	1	4	SEE (Viva voce)	50	50
3	AR 303	Theory of Architecture I	3	0	0	3	SEE	50	50
4	AR 304	History of Architecture III	3	0	0	3	SEE	50	50
5	AR 305	Architectural Structures III	3	0	0	3	SEE	50	50
6	AR 306	Building Services I	3	0	0	3	SEE	50	50
7	AR 307	Computers in Architecture II	1	0	1	2	CIE	100	
8	AR 308	Study Tour	0	0	1	1	SEE (Viva voce)	100	
		TOTAL	22	0	4	26			

TW = TERM WORK CIE = CONTINUOUS INTERNAL EVALUATION
SEE = SEMESTER END EXAMINATION P = Pass F = Absent & fail
X = Eligible for Makeup examination

Evaluation Pattern : Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva Voce	Elective / Book Review
AR301	Architectural Design - II	20	15	05	10

Subject Code	Subject Name	Portfolio	Viva
AR302	Building Materials & Construction Technology III	40	10
AR308	Study Tour	60	40

Subject Code	Subject Name	Assignment	Project
AR307	Computers in Architecture II	50	50

Note:-

- Electives and Book reviews are a part of Basic/Architectural Design
- Literature survey will be a requirement for Architectural design study. Periodical review by an external jury for subjects going for viva voce.
- National/International tours may be arranged during vacation to students, to study examples of good Architecture. The tour details will be announced in the semester I-VI.
- For all viva voce examinations one internal faculty and one external faculty will conduct the exam.
- Portfolios have to be submitted on prescribed date for all the subjects on the date announced by the department for one year.
- All students have to register on the first day at the beginning of the **Viva voce exam.**
- All students have to register on the first day of **Term work exams.**

**SCHEME OF TEACHING AND EXAMINATION IV SEMESTER B ARCH
ACADEMIC YEAR 2019- 2020**

2018 Batch			Teaching scheme per week			Examination scheme		CIE Marks	SEE Marks
Sl no	Code	Subject	Lecture / Studio	Tutorial	Practical (Study Tour/ Case study)	Total	Exam		
1	AR 401	Architectural Design III	6	0	1	7	SEE (Viva voce)	50	50
2	AR 402	Building Materials & Construction Technology IV	3	0	1	4	SEE (Viva voce)	50	50
3	AR 403	Theory of Architecture II	3	0	0	3	SEE	50	50
4	AR 404	Climate Responsive Architecture	2	0	1	3	TW	50	50
5	AR 405	Architectural Structures IV	3	0	0	3	SEE	50	50
6	AR 406	Building Services II	3	0	0	3	SEE	50	50
7	AR 407	Computers in Architecture III	1	0	1	2	CIE	100	
8	AR408	Constitutional Law	1	0	0	1	SEE	50	50
		TOTAL	22	0	4	26			

TW = TERM WORK CIE = CONTINUOUS INTERNAL EVALUATION

SEE = SEMESTER END EXAMINATION

Evaluation Pattern : Marks allocation for SEE

Subject Code	Subject Name	Design	Drawing	Viva Voce	Elective / Book Review
AR401	Architectural Design - II	20	15	05	10

Subject Code	Subject Name	Portfolio	Viva
AR402	Building Materials & Construction Technology IV	40	10

Subject Code	Subject Name	Theory	Project
AR404	Climate Responsive Architecture	30	20

Subject Code	Subject Name	Assignment	Project
AR407	Computers in Architecture III	50	50

Note:-

- Electives and Book reviews are a part of Basic/Architectural Design
- Literature survey will be a requirement for Architectural design study. Periodical review by an external jury for subjects going for Viva voce.
- National/International tours may be arranged during vacation to students, to study examples of good Architecture. The tour details will be announced in the semester I-VI.
- For all viva voce examinations one internal faculty and one external faculty will conduct the exam.
- Portfolios have to be submitted on prescribed date for all the subjects on the date announced by the department for one year.
- All students have to register on the first day at the beginning of the **Viva voce exam**.
- All students have to register on the first day of **Term work exams**.

SEMESTER – III

ARCHITECTURAL DESIGN II

Course Code: AR301

Pre requisite: Nil

Course Coordinators: Prof. Pushpa Devanathan

Credits: 6: 0: 1

Contact Hours: 112 hrs

Course Objectives:

Students will be introduced to

- Creation of space with a complimentary form.
- Explore the effect of light, movement, scale and the structure on the built environment.
- The relation between site and building.
- Exploration of the relation between the user and the space.
- Exploration of study models for form development.

Course Contents:

UNIT I

Introduction to small scale public buildings, Case studies of projects (live and literature) , Explore the relationship between spaces and architectural form, observe aspects of design like lighting, circulation, structures in relation to form and the building. Scale: monumental scale, human scale, study circulation flow, analyze and interpret data – form guidelines for design.

UNIT II

Concept development – site studies/analysis and zoning based on functions, concept related discussions and group activities, evolution of conceptual sketches and encouraging study models to understand volumes, massing and frame aesthetics; reviews & revisions to emphasize design process.

UNIT III

Manual drafted drawing – Emphasis on transformation of conceptual drawings to the 2D drawing. Basics of preparation of floor plans, elevations and sections, reviews and revisions.

UNIT IV

Drafting, rendering using different medium views and sketches and enable the students towards presentation techniques and understanding the form by 3D manual study models.

UNIT V

Preparation of final sheets with all the requirements with final models.

References:

1. “How Designers Think “by Bryan Lawson
2. Time savers standards for architectural design data by John Hancock
3. Neufert’s standards
4. Form, Space & Order by Francis DK Ching

Course outcome (COs):

The students will be able to

- Use the design philosophy through case study and literature studies. (PO- a, g, i, j)
- Demonstrate relation between site and building. (PO- b, c)
- Establish relationship between space making & form generation. (PO – b, c)
- Adopt manual presentation techniques. (PO - k)

SEMESTER – III

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY –III

Course Code: AR302

Prerequisite: Nil

Course Coordinators: Prof. Vishwas Hittalmani

Course Credits: 3: 0: 1

Contact hours: 70 hours

Course Objectives:

To introduce to the students:

- The fundamental principles of RCC in framed structures.
- The fundamental principles of Staircases and its constructions.
- An understanding of the basic building materials.

Course Contents:

UNIT I

Scaffolding and formwork :

Materials used and scaffolding methods, its advantages and disadvantages.

UNIT II

RCC Foundation and Columns: RCC footings, raft foundation, grilled foundation and columns.

UNIT III

Trusses: Types of timber roof trusses, detail study of king post truss and queen post truss.

UNIT IV

Material study: Study of Concrete as construction materials including their composition, characteristic properties, application etc. Different types of floor finishes.

References:

1. “Construction Technology” By Chudley
2. “Construction Of Buildings” By Barry
3. “Building Construction, Principles, Practice And Materials” By Hardie Glen
4. “Text Book Of Building Construction” By Arora & Bhindra
5. “Building Construction Illustrated” By Francis D K Ching

Course Outcome (COs):

Students will be able to

- Draft and read architectural drawings of a framed structure. (PO – g , k)
- Identify the basic building components such as footing, column and their construction methods. (PO - c)
- Use appropriate building materials based on the properties, behavior and applications and identify the particular materials for usage in construction of load bearing buildings. (PO - c)
- Use innovative details in construction. (PO - k)

SEMESTER – III

THEORY OF ARCHITECTURE - I

Course Code: AR303

Pre requisite: Nil

Course coordinator: Associate Prof. Sudha Kumari

Credits: 3: 0: 0

Contact Hours: 42 hours

Course Objectives:

To enable students to

- Explore how design compositions are made.
- Analyze, criticize and appreciate compositions based on principles
- Explore various aspects of aesthetics in design.

Course Contents:

UNIT -I

Introduction to Theory of Architecture, Organizing principles in design – Axis, Symmetry, Asymmetry, Datum, Linear arrangement, Radial arrangement, Concentric Arrangement.

UNIT -II

Principles of architectural composition - Unity, Duality, Rhythm, repetition, Scale, Theory of Proportions.

UNIT -III

Principles of architectural composition- Contrast, Restraint, Repose, Punctuation/Definition, Strength, Accentuation, Gradation, Hierarchy, Balance, Harmony, Vitality, Dynamism.

UNIT -IV

Spatial organization –Central, Linear, radial, clustered, Grid organizations Ornamentation, Character/Style in architecture.

UNIT -V

Building Materials: Stone, Brick, concrete, Timber. iron & steel, Glass
Generation of forms- Pragmatic, analogic, Canonic and Iconic.

References:

Form, space and order – Francis D K Ching

Course Outcome (COs):

Students will be able to

- Assess the kind of spatial organization possible for a given site. (PO – a, k, j)
- Identify what contributes to aesthetics in design and incorporate the various principles and elements of composition. (PO – a, c, k)

SEMESTER – III

HISTORY OF ARCHITECTURE -III

Course Code: AR304

Prerequisite: Nil

Course Coordinators: Assnt. Prof. Reema H Gupta

Course Credits: 3:0:0

Contact hours: 42 hours

Course Objectives:

- The students should be able to develop an in depth understanding of Hindu and Islamic Architectural styles.

Course Contents:

UNIT I

- Chalukyas - Influences & Architectural Character, Study of Ladkhan temple, Aihole; Durga Temple, Aihole; Papanath temple and Virupaksha temple at Pattadakal ; Dravidian Temple.
- Introduction and Architectural Character.
- Pallavas - Influences & Architectural Character, Rock cut and structural temples .
- Study of Shore temple and Rathas of MamaUapuram, Kailashnath temple and Vaikunta Perumal temple at Kanchipuram.
- Cholas - Influences & Architectural Character, Study of Brihadeeswara temple at Tanjore.
- Pandyas - Influences & Architectural Character, Gopurams.
- Vijayanagar - Influences & Architectural Character,– Study of Vittala temple and Hazara Rama temple at Hampi
- Nayaks - Influences & Architectural Character, Study of Meenakshi temple at Madurai

UNIT II

- Later Chalukyans and Rashtrakutas - Influences & Architectural Character
- Study of Mahadeva temple at Ittagi and Kailashnath temple at Ellora
- Hoysala - Influences & Architectural Character, Study of Keshava temple at Somnathpur and Hoysaleswar temple at Halebid
- Jain Architecture with Study of Adinath temple at Ranakpur
- Gupta Architecture with Study of Dasavatara temple at Deogarh
- Orissa - Influences & Architectural Character, Study of Lingaraja temple at Bhuvaneshwar and Sun temple at Konark
- Central India - Influences & Architectural Character, Study of Khandariya
- Mahadev temple at Khajuraho
- Gujarat - Influences & Architectural Character, Study of Sun temple at Modhera

UNIT III

- Islamic Architecture -Introduction, principal parts of mosque and tomb
- Slave Dynasty - Influences & Architectural Character, Study of Qutb Minar and Quwwat. - ul - Islam mosque at Delhi, Tomb of Iltutmish.
- Khalji dynasty - Influences & Architectural Character, Study of Alai Darwaza
- Tughlaq dynasty - Influences & Architectural Character, Study of Tomb of Ghiyas-ud-din Tughlaq, Khirki Masjid.
- Sayyed and Lodi dynasties- Influences & Architectural Character.
- Moghul period- Influences & Architectural Character, Study of Humayun's tomb, Fatehpur sikri, Tai Mahal

UNIT IV

- Provincial styles
- Punjab - Influences & Architectural Character, Study of Tomb of Shah Rukn - I - Alam
- Bengal - Influences & Architectural Character, Study of Eklakhi tomb and Adina Masjid
- Jaunpur- Influences & Architectural Character, examples – Study of Atala Masjid
- Bijapur - Influences & Architectural Character, examples – Study of Gol Gumbaz
- Sur Dynasty- Influences & Architectural Character

References:

1. History of Architecture by Bannister Fletcher
2. Indian Architecture – Buddhist and Hindu period by Percy Brown
3. Indian Architecture – Islamic period by Percy Brown
4. History of Architecture in India by Christopher Tadgil

Course outcome (COs):

students will be able to

- Identify the Hindu and Islamic architectural styles, character and influence. (PO - a, g, h, i, c)
- Differentiate the architectural features of both the styles of architecture. (PO – a, k)

SEMESTER – III

ARCHITECTURAL STRUCTURES – III

Course Code: AR305

Credits: 3:0:0

Prerequisite: NIL

Contact hours: 42 hours

Course Coordinator: Assnt. Prof. M.Vijayanand

Course Objectives:

To enable students

- To learn and understand the analysis of structural system.
- To develop the ability to interpret data and analyze structural system.

Course Contents:

UNIT I

Statically Determinate and Statically indeterminate structures: Introduction, Statically indeterminacy, external redundancy, internal redundancy, statically indeterminacy of structures with hinges, space frames, and pin jointed structures, Kinematic indeterminacy.

UNIT II

Slope and Deflection: Introduction, application of Macaulay's method to statically determinate beams, problems, introduction to Moment area method, application of moment area method for statically determinate beams, problems.

UNIT III

Consistent deformation method for statically indeterminate structure: Introduction, Procedure for the analysis of Propped cantilever and fixed beams, Problems.

UNIT IV

Moment Distribution Method for Continuous beam without settlement: Introduction, basic theorems, sign conventions, Propped cantilever beam, Continuous beam (Two span and Three span), Problems.

UNIT V

Moment Distribution Method for Symmetrical non sway frames and rectilinear frames: Introduction, analysis of rectilinear frame, analysis of portal frame, Problems.

References:

1. Punmia B C and AK Jain “Strength of Materials and theory of Structures”, Vol 2 Laxmi Publications, New Delhi, 2010.
2. Vaidyanathan R and Perumal P, “Comprehensive Structural Analysis Vol I and II”, Laxmi Publications, New Delhi, 2010.
3. T S Thandavamoorthy, “Structural Analysis”, Oxford University Press, New Delhi, 2011.
4. K U Muthu, M.Vijayanand etal; “Basic Structural Analysis”, I K International Publisher, New Delhi , 2011.
5. K U Muthu, M.Vijayanand etal; “Indeterminate Structural Analysis”, I K International Publisher, New Delhi , 2014

Course Outcome (COs):

The students will be able to

- Do the analysis of structural systems for statically determinate and indeterminate structures, by identifying the method of analysis of beams. (PO-a, e)
- Analyze structural systems and interoperate data by predicting the possibilities in continuous beams, frames, indeterminate beams and solve under various types of loading and support conditions. (PO-a, e)

SEMESTER – III

BUILDING SERVICES –I

Course Code: AR306

Credits: 3:0:0

Prerequisite: NIL

Contact hours: 42hours

Course Coordinator: Prof. Vishwas Hittalmani

Course objectives:

Study the building services of water supply and sanitation and their integration with architectural design.

Course Contents:

UNIT I

Introduction, per capita water demand, sources of water supply, qualitative and quantitative aspects.

Water quality, physical, chemical and bacteriological quality, Drinking water Standards – water borne diseases.

UNIT II

Purifications – Flow sheet of treatment plant – sedimentation, coagulation, filtration, Slow sand filter, Rapid sand filter and Pressure filter.

Disinfection, objective of disinfection, Methods of disinfection, Break point chlorination.

UNIT III

Distribution system – methods of layout of distribution pipes.

Provision for firefighting – fire hydrants.

Domestic water supply system – mains, ferrules, service pipe, water meter, sump, pumps, overhead tanks, distribution pipes, cold water and hot water supply for single and multistoried buildings. Pipes sizes, fittings valves, types of taps,. Rain water harvesting.

UNIT IV

Introduction, importance and purpose of sanitation, methods of sanitation, definitions.

Systems of drainage – separate, combined and partially separate system, advantages and disadvantages of each system. Sanitary requirements for various types of buildings, types of pipes.

Man holes – drop manholes, manhole with intercepting trap, inspection chambers, self cleansing velocity

Sewage treatment- flow sheet, purposes of each unit.

Sewage treatment and activated sludge process – trickling filter - Sketch & description.

UNIT V

House drainage – principles, traps-floor trap, multi-trap, gully trap, grease and oil trap, urinals, Indian, European, Anglo Indian type of water closets, squatting, urinal, wash basins, sink, bath tubs, flushing cistern.

Systems of plumbing – single stack, one pipe, one pipe partially ventilated, two pipe disposal of waste water from buildings. Solid waste management.

Typical plan of residence – showing all the traps, inspection chambers, pipes connected to public sewer line.

Septic tanks – soak pit, soak well, design aspects, disposal of effluent.

oxidation ponds- Sketch & description

References:

1. Sanitary Engineering by R S Deshpande
2. Water Supply and Sanitary Engineering by S Birdii
3. Relevant IS Codes of India

Course outcome (COs):

The students will be able to

- Provide schemes of Water Supply and Sanitation required for any building. (PO-i, e)
- Select various fixtures available in the market to suit the context. (PO-i, e)

SEMESTER – III

COMPUTERS IN ARCHITECTURE -II

Course Code: AR307

Prerequisite: Nil

Course Coordinator: Asst. Prof. Aruna Gopal

Credits: 1 : 0 : 1

Contact Hours: 28 hours

Course Objectives:

To enable student to develop skills for

- Using computers as a tool for architectural design representation
- Drawing management & standard practices
- Creating detailed drawings using annotations
- Learning presentation techniques & plotting of drawings

Course Contents:

UNIT I

Introduction to AutoCAD & User interface Tour, units, limits, Draw tools, Exercises.

UNIT II

Modify: All modify tools.

Measuring tools: Enquiry commands Drafting settings, Exercises.

UNIT III

Drawing Organization: Layers, Properties, Line types, Line weights, colors.

UNIT IV

Annotations: Texts & dimensions.

UNIT V

Plotting & Presentation: Blocks, Layouts, page setup manager, plotting to scale, plot styles.

References:

1. AutoCAD Reference Guide: Everything You Wanted to Know about AutoCAD--Fast! By Dorothy Kent
2. Autodesk official website
3. AutoCAD 2013 and AutoCAD LT 2013 Bible by Ellen Finkelstein - 2012
4. Video Tutorials online

Course outcome (COs):

The students will be able to

- Use drawing tools to represent 2D graphics of the design. (PO – k, I, g)
- Organize & create standards to represent drawings. (PO – k, I, g)
- Detail the drawings created with annotations.(PO – k, I, g)
- Present the design drawings & learn to plot to different scales.(PO – k, I, g)

SEMESTER – III

STUDY TOUR

Course Code: AR 308

Credits: 0:0:1

Prerequisite: Nil

Course Coordinator: Associate Prof. Meghana Raj

Course Objectives:

The students are exposed to

- Understand the evolution of the the building process.
- Understand the existing projects
- Understand the elements of building and its transformation over the years

Course Contents:

UNIT I

Develop the ability to study and identify the various architectural styles practiced by different dynasties from 3rd century BC to present, influences on architectural styles due to geographical locations, cultural practices and political stability.

Site visits also includes study of modern architectural styles , theories practiced through built spaces and their evolution and influences.

Study of materials used is also an integral part of the site visits.

Course outcome (COs):

The students will be able to:

- Do the measure drawing of simple buildings. (PO – d, f)
- Represent the different elements of architecture (PO – g)
- Translate their ideas in the form of drawings. (PO – g, h)

SEMESTER - IV

ARCHITECTURAL DESIGN – III

Course Code: AR401

Pre requisite: Nil

Course Coordinators: Prof. Pushpa Devanathan

Credits: 6: 0: 1

Contact Hours: 112hours

Course Objectives:

Students will be introduced to:

- The concept of community living and interactive spaces
- The need for privacy, circulation, socio-economic determinants
- Regulatory controls.

Course Contents:

UNIT I

Behavioral study, Services study, Literature survey, Data collection, Case study of neighborhoods,

UNIT II

Introduction to projects related to community living,

UNIT III

Site-study, Analysis, Zoning; Concept and master plan development

UNIT IV

Preparation of detailed plans, sections, elevations, views and model

References:

1. Time savers standards for architectural design data by John Hancock
2. Architectural Graphics Standards by Ramsay and Sleeper
3. Neufert's standards

Course outcome (COs):

The students will be able to

- Apply community living concept. (PO – a, c, h)
- Determine socio-economic determinants. (PO – h, f)
- Use regulatory controls. (PO – j, f)

SEMESTER – IV

BUILDING MATERIALS & CONSTRUCTION TECHNOLOGY -IV

Course Code: AR402

Credits: 3: 0: 1

Prerequisite: Nil

Contact Hours: 70 hours

Course Coordinators: Prof. Vishwas Hittalmani

Course Objectives:

- To introduce various RCC roofing systems
- To develop an understanding about deep foundation construction techniques.
- To understand the details of slab construction for various spanning conditions of structure.

Course Content:

UNIT I

Introduction to slabs, Column position and centerline drawing, RCC One-way slab, Two-way slab, One-way Continuous slab, Cantilever slabs, overhangs.

UNIT II

Flat Slab, Ribbed Slab, Waffle slab

UNIT III

Filler Slab, Coffered Slab, Precast Slab

UNIT IV

Dome, Vaults, Pitched Roof and Lean-to-roof

UNIT V

Pile foundation

Materials – Characteristics and types of Paints, Wall finishes, Internal and External plastering.

References:

1. “Building Construction” by Mackay-Vol-1 to 4.
2. “Construction Technology” by Chudley
3. “Construction of Buildings” by Barry
4. “Building Materials” by Rangwala

Course outcome (COs):

The students will be able to

- Apply technicalities, details and characteristics of RCC slab Construction. (PO – c, h, k)
- Apply deep foundation construction techniques (PO – c, h, k)
- Use innovative details in construction.(PO – h, k)

SEMESTER – IV

THEORY OF ARCHITECTURE II

Course Code: AR403

Prerequisite: Nil

Course Coordinator: Associate Prof. Sudha Kumari

Credits: 3 : 0 : 0

Contact Hours: 42 hours

Course Objectives:

To introduce to the students

- A broad over view - the evolution of thought and trends, across timeline, of Western Architectural world during Renaissance, Baroque, Neo Classical and Modern periods

Course Contents:

UNIT I

Antiquity to 17th century : Introduction - the connection between theories and application in various eras, overview of architecture concepts being done in the 21st century, Three fundamentals prescribed by Vitruvius, Identifying the three fundamentals of Vitruvius in world architecture, Contributions of Vitruvius – ‘De Architectura’, significance of ‘Vitruvian man’, Medieval architecture overview, Introduction to Renaissance, Renaissance concepts – Alberti, Cartesian theory, French academic tradition, Contributions of Blondel

UNIT II

Theories of 18th & 19th centuries: Ideas of Marc Antoine Laugier, Ideas of Etienne Louis Boule, Gottfried Semper – ‘Four elements of Architecture’, Gottfried Semper – ‘Theory of clothing’, Theory of clothing in the works of modern architects Herzog and Meuron

UNIT III

Modern movement: Introduction to modern movement, Louis Sullivan, Adolf Loos, Walter Gropius, Mies Van der Rohe, Eero Saarinen, Otto Wagner, Louis Kahn. Modern movement masters – Frank Lloyd Wright, Erich Mendelsohn, Richard Neutra, Kenzo Tange, Le Corbusier.

UNIT IV

Post modernism & De-constructivism: Introduction to Post modernism, Post modern theory – Robert Venturi, Charles Jencks, Introduction to Deconstructivism, Fundamental beliefs and philosophies of Peter Eisenman

UNIT V

Research oriented: Architectural thought – Amos Rappaport, Architectural thought – Geoffrey Broadbent, Architectural criticism overview

References:

1. Form, space and order – Francis D K Ching
2. Design in Architecture - Geoffrey Broadbent
3. Modern movements in Architecture – Charles Jencks

Course outcome (COs):

- Students will be able to identify the evolution of thoughts and trends across timeline of Western Architecture. (PO – a, j, k)
- To understand the processes of design from pre historic to modern times (PO – b, c, l)
- To analyze the various built forms through critics(PO – d, e, f)

SEMESTER – IV

CLIMATE RESPONSIVE ARCHITECTURE

Course Code: AR404

Prerequisite: Nil

Course Coordinator: Assnt Prof. Apoorvalakshmi R

Course Credits: 0:2:1

Contact hours: 42 hours

Course Objectives:

To expose to the students

- The knowledge required for understanding the influence of climate on architecture.

UNIT I

Introduction: Elements of climate, Enumerating and representing climatic data. Classification of climate, major climatic zones of the world, tropical climate further classification

UNIT II

Thermal comfort: Effect of climatic elements on thermal comfort, heat exchange process, effective temperature

Construction Techniques: Construction techniques to improve thermal performance of walls and roofs in various climatic zones

Natural Ventilation: Effects of openings in internal and external features, design considerations etc.

Effect of landscape elements and site topography.

UNIT III

Design considerations: Design consideration for various climatic zones of India with respect to shading devices, day light factors, rains etc.

References:

1. Manual of Tropical Housing – Koenigsberger
2. Tropical Architecture - C.P. Kukreja
3. Climate Responsive Architecture – Arvind Krishnan.

Course outcome (Cos):

The students will be able to:

- Understand the basic principles of various climatic systems (PO – a, c, k)
- Give design solution for different climatic zones (PO – a,c,k)

SEMESTER – IV

ARCHITECTURAL STRUCTURES – IV

Course Code: AR405

Credits: 3:0:0

Prerequisite: NIL

Contact hours: 42 hours

Course Coordinator: Assnt. Prof. M.Vijayanand

Course Objectives:

- The students are exposed to the Design of Reinforced Concrete Structures with emphasis on Limit State Method.
- The student should be able to analyze and design of basic structural elements

Course Contents:

UNIT I

Design Philosophy – Concept of Elastic method, ultimate load method and limit state method – Limit State philosophy - IS code provisions – Load and Load combinations – Stress and strain relationship of reinforcing steel and concrete

UNIT II

Limit state design of Beams – Analysis and Design of Singly and Doubly reinforced beams and Analysis of T- beam

UNIT III

Limit state design of Slabs – Design of one way simply supported and continuous slab. Design of Two way rectangular slab subjected to uniformly distributed load for various boundary conditions, Design of stair case (dog- legged).

UNIT IV

Limit state design of column – Design of short axially loaded RC columns, RC Columns with uniaxial moment

UNIT V

Limit state design of Footing – Loads on foundation, types of footing, Design of axially loaded square footing

References:

1. Unnikrishna Pillai, S., Devadas Menon, “Reinforced Concrete Design”, Tata McGraw-Hill Publishing Company Ltd., New Delhi. 2006
2. Varghese, P.C., “Limit State Design of Reinforced Concrete” (Second Edition), Prentice Hall of India, Pvt. Ltd., New Delhi. 2006
3. Krishna Raju, N., “Design of Reinforced Concrete Structures”, CBS Publishers & Distributors, New Delhi 2010
4. Gambhir M.L., “Fundamentals of Reinforced concrete design”, Prentice Hall of India, Pvt. Ltd., New Delhi 2006.

Course outcome (COs):

The students will be able to

- Use the basic concept and design methods of RC structures. (PO – a, e)
- Conduct overall design of RC structures. (PO – a, e)

SEMESTER – IV

BUILDING SERVICES II

Course Code: AR406

Prerequisite: Nil

Course Coordinators: Prof. Vishwas Hittalmani

Credits: 3: 0: 0

Contact Hours: 42hours

Course objectives:

Enable students to

- Achieve proficiency in application of electrical services in design & construction.
- Study the materials used in electrical services for buildings.
- Gain practical knowledge of electricity and illumination applications used in current architectural practice.
- Comprehensively plan and design the electrical and illumination scheme of a building.

Course contents:

UNIT I

Study of supply and distribution of electricity to buildings from generating stations to load centers; overhead versus underground distribution systems, line supports, panel boards, etc.

Service connections, Substations, transformers, panel boards, distribution boards, fuses, MCB.

UNIT II

Wires and cables-Conductor materials used in cables, Insulating materials, Types of cables used in internal wiring. Internal supply and distribution electrical energy; Types of Earthing.

UNIT III

Quality and quantity of light; Methods of lighting – Ambient, task and accent lighting, street lighting, factory lighting. Systems of luminaries, direct, indirect, etc.

Types of electrical lamps – incandescent, fluorescent/CFL, LED, neon lamps and their lighting characteristics; Design considerations for different types of occupancies and tasks and calculation of lighting requirement

UNIT IV

Electrical Load Estimation- Preparation of electrical scheme and the electrical load calculations for buildings

UNIT V

Fire prevention, precaution, Fire resisting materials, Alarm equipments, extinguishers, Sprinklers, detectors; Fire escape lift, staircase, etc; Fire stations, Systems adopted in various building types against fire, case studies; Fire – Norms and regulations as per bye-law, NBC – fire and life safety

References:

1. “Electrical Engineering” by Anwari.
2. Electrical Technology by VH Cotton
3. “Electrical wiring, Estimation and Costing”, by L Uppal.

Course outcome (COs):

The students will be able to

- Prepare, Design and estimate the electrical load required for any building. (PO – k, h, c)
- Design lighting schemes required for different occupancies and tasks. (PO – k, h, c)
- Apply fire fighting norms while designing a building. (PO – k, j)

SEMESTER – IV

COMPUTERS IN ARCHITECTURE –III

Course Code: AR407

Prerequisite: Nil

Course Coordinator: Assnt. Prof. Aruna Gopal

Credits: 1: 0: 1

Contact Hours: 28hours

Course Objectives:

To enable students

- To develop skills required in using computers as a tool for architectural design representation
- To develop 3D modeling techniques for visualization & to create photorealistic outputs using 3dsMax.
- To learn Rendering and Presentation techniques using 3dsMax and Photoshop.

Course contents:

UNIT I

User Interface essentials: Interface setup, Units, Navigational tools.

Basic commands: Open, Save, import from CAD, Export options.

Transform tools: Move, copy, rotate, scale, selection options

UNIT II

Modeling: Standard & Extended primitives, 2D shapes

Editing & Modifying: Edit spline, Edit Mesh, Extrude, Sweep, loft, lathe, Twist,

Taper, Editpoly, Boolean commands

UNIT III

Materials: Material Editor, Textures, colors, Bump, Opacity, Reflection controls

Mapping: UVW map, real world scale adjustments

UNIT IV

Lights: Standard lights, mental ray light parameters

Shadows: Shadow types & Parameters

UNIT V

Rendering: Render setup parameters, Output formats.

UNIT VI

Presentation techniques: Photoshop tools & techniques, Draw tools, Filters, toning, selections, effects.

References:

1. Autodesk official website
2. Autodesk 3dsMax Bible by Kelly L
3. Autodesk 3dsMax 2013: A Comprehensive guide by Sham Tickoo, Purdue University Calumet
4. Video Tutorials – online
5. Revit and Vector software

Course outcome (COs):

The students will be able to

- Use 3dsMax for Building visualization & Design representation. (PO – k, j)
- Visualize the Materials & Lighting aspects of Design & create realistic renderings. (PO – k)
- Create good design presentations & Compositions with the help of Photoshop. (PO – k)

SEMESTER – IV

CONSTITUTIONAL LAW

Course Code: AR408

Prerequisite: Nil

Course Coordinator: Humanities Dept

Credits: 1: 0: 0

Contact Hours: 14 hours

Course Objectives:

- To provide basic information about Indian constitutional law.
- To identify individual role and create legal awareness.

Course Content:

UNIT I

Evolution of Indian Constitution ,The Preamble, Fundamental Rights in details and exercise of rights under Part III, Limitations & Important cases.

UNIT II

Relevance of Directive Principles of State Policy under part-IV, Fundamental Duties & their significance. Special constitutional provisions for SC&ST, Women & Children.

UNIT III

Union executive-President, Prime Minister, Parliament & State executive-Governor, Chief Minister, State legislatures.

UNIT IV

Union and state judiciary -Supreme Court of India& High courts of state.

UNIT V

Emergency provisions, Electoral process, Amendment procedure and Major Constitutional amendments.42nd, 44th, 74th, 76th, 86th and, 91st amendments.

References:

1. Introduction to Constitution of India -Durga Das Basu 19th/20th edition 2001
2. Constitution of India and Professional Ethics – K.R PHANEESH 5th edition 2008
3. Constitutional law of India — Dr.J.N.Pandey, Central Law Agency 37th edition 2001
4. A Primer on Constitution of India & Professional ethics, VTU Publication-2002

Course outcome (COs):

The students will be able to

- Enhance legal literacy. (PO- h, i)
- Analyze and implement certain laws in their day to day activities. (PO- c)